the parents are so remotely related that they are separated by seven or more "free generations," the chances are (unless one of the parents is highly prepotent) that, notwithstanding the great merits of the immediate ancestors and the expectations of Mendelians, the offspring will revert to mediocrity. Hence it is not enough that breeders should "mate the best with the best, avoiding close affinities"; they must avoid crossing distinct strains even when the members of one strain closely resemble those of another. This implies that, in addition to knowing the pedigree of their stock, breeders should know as much as possible of the wild races from which modern varieties and strains were originally derived.

J. C. EWART.

Arctic Plants from the Valley Gravels of the River Lea.

I HAVE recently found a plant-bearing bed in the Low Level River-Drift of the Lea valley at Ponder's End. It is exposed in an excavation worked by the Great Eastern Railway Company, and I am indebted to Mr. Horace Wilmer, engineer to the company, for permission to carry on my investigations.

The plant-bearing bed is found at a depth of 14 to 18 feet below the surface. It is embedded in stratified gravel and sand, which presents much evidence of tumultuous accumulation. In immediate association with it are found tusks, teeth, and bones of the *Elephas primigenius*, *Rhinoceros antiquitatis* (if we are no longer permitted to call it *tichorhinus*!), and other Mammalia.

The pit is situated on the present floor of the valley of the Lea at a level of about 35 or 40 feet above the Ordnance datum.

In correlation with the archæological stages, the plant-bearing bed of Ponder's End is later than the Mousterien epoch. In fact, it is separated from this epoch by such a wide interval that it is in all probability post-Palæolithic. On the other hand, it is unquestionably pre-Neolithic, although the interval in this case appears to be comparatively short. There is thus little doubt that it comes within the period of the archæological hiatus between the Palæolithic and the Neolithic ages.

It is by far the most important plant-bearing bed that has hitherto been found upon this horizon within the area occupied by Palæolithic man in this country. It occupies a position not represented on the well-known sites of Hoxne or Hitchin. The only bed, so far as I am aware, which can be placed on the same horizon is that at the Admiralty Buildings, Westminster. This, however, only yielded two species of plants, one of them being the Arctic form *Betula nana*.

I am at present engaged upon working out the botanical material from this bed—a laborious task, occupying a large amount of time. I am submitting this to Mr. F. J. Lewis, who has very kindly undertaken its identification. A considerable amount of material has already been examined, and, so far, Mr. F. J. Lewis has succeeded in identifying ten species of plants, with four others doubtful. Three of this number, namely, *Salix herbacea*, *Betula nana*, and *Sibbaldia procumbens*, are distinctively Arctic, while most, if not all, of the remainder have a high northern range, although they are not confined to those regions. Mr. F. J. Lewis defines the assemblage as Late Glacial.

The researches of Mr. Clement Reid in beds associated with the Palæolithic deposits have shown that there have been many oscillations of climate in the south of England since the deposition of the Chalky Boulder Clay. With the evidence of this new bed before us there can be no doubt that the Palæolithic age was closed by a partial return to glacial conditions, succeeding an epoch, or epochs, when temperate conditions prevailed. This conclusion is in agreement with the results of recent work upon the mammalian fauna of the Pleistocene age.

This is not the place to enter further into this discussion. Enough has been said to indicate the importance of this bed in throwing further light upon the climatic changes of the Pleistocene age. It certainly suggests that the archæological hiatus is to be directly associated in the south of England with a final return of glacial conditions of climate.

If this view be sound, as I believe that it is, it seems to be perfectly justifiable to define Palæolithic man as interglacial, even although the last glacial phase above indicated could not, of course, compare in severity with those which preceded it.

S. HAZZLEDINE WARREN.

Sherwood, Loughton, Essex.

A New Theory of the Descent of Man.

IT is probable that some readers may fail to appreciate Prof. Klaatsch's "New Theory of the Descent of Man" at its proper worth owing to the technical terms and obscure descriptions used in the account published in NATURE of November 24 (p. 118). The theory is simply this. The Neanderthal man and the gorilla have continuous supraorbital ridges and similar markings for the insertion of muscles on their skeletons; the Aurignac man (who could pass as a fairly high type of modern humanity) has not a continuous supraorbital ridge, in which he presents a very superficial resemblance to the orang, and has certain muscular impressions on his skeleton somewhat similar to the orang's.

On this basis, which must be admitted to be "flimsy" in the extreme, Prof. Klaatsch builds his new theory and supposes that the gorilla and Neanderthal man are co-descendants of one branch, the orang and the Aurignac man of another. If one were to apply the principles used by Prof. Klaatsch to the canine in place of the human world, then we should say that the rough-haired Newfoundland is a co-descendant of a rough-haired bear, while the smooth-haired mastiff has arisen with the sleek leopard. An explanation is thus given of the points in which the Newfoundland and the bear, the mastiff and the leopard, have in common; but what of the hundred characters which the Newfoundland and the mastiff possess in common, and which separate them from the bear and leopard? Prof. Klaatsch ascribes these to "convergence phenomena." At least that is how he accounts for the fact that the Neanderthal and the Aurignac men have all the features common to humanity; one arose *via* the gorilla and the other arose *via* the orang, but both arrived at the same structural goal so alike that most of us regard them as the same species.

The theory, owing to the demand it makes on "convergence phenomena," passes somewhat beyond the limits of rational speculation. Prof. Klaatsch's theory has failed to gain the support of his able colleagues in Germany, and is not likely to receive serious consideration in this country.

A. KEITH.

Royal College of Surgeons, December 10.

The Cocos-Keeling Atoll.

IN reply to Mr. Wood-Jones's letter (NATURE, December 1), I would say that I still consider that his arguments against Sir John Murray's theory go in support of it.

Mr. Wood-Jones suggests the reason for the precipitation of calcium carbonate, *when it has once begun*, going on until the solution contains less than the normal quantity; what I wished to emphasise was that precipitation does not *begin* until more calcium carbonate than is normally present first passes into solution, *i.e.* that no crystals can be formed in the interstices of the massive corals in the lagoons until some of the dead coral is dissolved. There *is*, therefore, *proof* of solution in the lagoons of atolls.

In an early discussion on the same subject Sir John Murray pointed out that the processes of the solution of the carbonate of lime of dead shells and skeletons by sea water, and of its secretion by the living organisms, are going on side by side wherever there are life and growth, death and decay. In some regions secretion is in excess, and there is a formation of calcareous deposits; in others solution is equal to secretion, as in the red clay areas of the ocean; in others solution may be in excess of secretion, as in the larger and more perfect coral lagoons.

In small coral atolls the periphery is large relatively to the size of the lagoon, and the secretion of lime and the formation of coral sand are greatly in excess of the solution that takes place, hence the lagoon becomes filled up.

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In large atolls, on the other hand, the periphery is small relatively to the size of the lagoon; there is less secretion and formation of coral sand by the living outer surface than is removed in solution from the lagoon, which is, in consequence, widened, deepened, and reduced to a more or less uniform appearance.

MADGE W. DRUMMOND.

Challenger Office, Villa Medusa, Boswell Road,
Edinburgh, December 6.

Positions of Birds' Nests in Hedges.

ABOUT a year ago I wrote to NATURE (December 16, 1909) giving certain facts which I had noticed with regard to the position selected by birds when building. There seemed to be good reasons for such selection, but I wanted to know whether the conditions I had noticed were local or general. The letter sent to NATURE by Mr. A. R. Horwood showed that similar conditions were found in Leicestershire, Shropshire, and Surrey. Of the information which reached me directly, one letter deserves mention.

Mr. Francis G. Cousins enlisted some of the boys of the Johnstone Schools, Durham, as observers. Out of eight nests, the positions of which are given in the terms of my letter, two only faced north, one faced north-west, four south-east, and one south. I quote the following note sent by these observers:—"In the north-east of the district, with fairly open country, the nests faced north-east, and *at their rear was a vast extent of woods.* In the south-east of the district the nests face south-east, *with woods again at their backs* and open country in front." The italics are mine. I need not labour the conclusion that birds seek sun and warmth when building their nests. In this connection it is interesting to quote an observation made by Mr. Roosevelt ("African Game Trails," p. 290). He notes that, in Guaso Nyero, just north of the equator, the weaver birds place the mouth of the nest invariably towards the north, away from the strong, prevailing winds.

J. H. TULL WALSH.

Heath House, St. Faiths, Norwich, December 11.

Tribo Luminescence of Uranium.

I HAVE not seen in recent literature any reference to the "tribo" luminescence shown by uranium salts, and by metallic uranium in particular. Having accidentally knocked over a bottle containing 2 grams of the latter substance, I was surprised to see the bottle glow with a brilliant yellowish-white light, and on shaking the bottle the luminosity could be maintained to such an extent that the label on the bottle was read with ease, and the general illumination seen easily throughout a large lecture-room. The best way to see the glow is to bring the bottle sharply down on the palm of the hand.

On repeating the experiment with compounds of uranium, the nitrate and yellow oxide show the same effect, but to a very much smaller degree, whilst the black oxide and sodium uranate do not give it.

I expect the above must be known to workers with uranium salts, but it may be useful to some of your readers to know a method by which tribo luminescence may be so easily demonstrated.

W. A. DOUGLAS RUDGE.

Grey University College, Bloemfontein, November 18.

MARKED BIRDS IN TWO SENSES.[1]

(1) THE interesting brochure referred to below gives an account of the bird observatory belonging to the German Ornithological Society at Rossitten, which, already well known, is likely to become in the future of prime importance in securing data, by local observations and by the labelling of living birds, towards the determination of many obscure questions in bird migration.

Rossitten is situated on the narrow belt of sand-dunes, lying between Cranz and Memel, which bank out the Baltic Sea from the Kurische Haff, the more northern of the two lagoons chiefly forming the seaward face of East Prussia. The station—mainly designed by Dr. Thienemann, the distinguished ornithologist—was established in January, 1901, and fitted up at the expense and under the auspices of the Ministers of Education and Agriculture. Being, therefore, a State institution, it will possess greater stability than it could have had under the private enterprise of the society alone. Dr. Thienemann is director of the station, and holds with this post that of Custos of the zoological collections of the neighbouring university in Konigsberg. Ulmenhorst, the actual designation of the observatory, derives its name from the generous lord of the manor, Herr E. Ulmer, who presented, in 1907, the present buildings in a new and more favourable site, some seven kilometres from Rossitten, than the original installation. Here Dr. Thienemann and his assistants, cut off from the world, spend the dreary and stormy season of the year from October 1 to May 1. The station stands on the narrowest part of the sand-spit, whence the observers have a free and unrestricted view of the area between the seaward and the inner sandhills, and can study the birds which specially collect there under genuinely natural conditions. Previous observations made along this stretch of sand-dunes, on the movements of the hooded crow (*Corvus corax*), proved that a migration route of great importance passed along it, and that every year it was a rendezvous for flocks composed of the same individuals. The site, therefore, though peculiar and isolated, has been deliberately chosen because of its special advantages.

The chief objects of the observatory are to record the exact dates and composition of the migration flights, with the numbers and age of their component species; the direction in which the birds travel; the velocity and altitude of their passage (to be determined by the use of field telephones and box-kites), and the atmospheric conditions prevailing during its continuance, with the effect of any changes on the migratory stream. Many other cognate questions are to be inquired into, such as bird-life in relation to food supply, moulting, and colour changes in the plumage at different ages, the economical value of birds, and the most suitable means of protecting useful species. It is intended also to form extensive collections of the skins and internal parts of the birds of the Nehrung and neighbourhood for reference and systematic study. The scope of these observations as proposed to be carried out at Rossitten, if covering a somewhat wider field than, does not greatly differ from that undertaken by, the committee of the British Ornithologists' Union and by other observers elsewhere. Valuable as the observations all are, however, they do not, as was pointed out in NATURE of May 26, 1910, seem likely to carry us further forward than we at present are towards the solution of the phenomena of migration, until such observatories are more numerous and widely distributed; for what is now required is to trace individual birds or flocks along every part of their route from their birthplace to their winter quarters, and back again several times. These feathered armies may change their altitude, speed, and direction, or may break up into several battalions beyond the nearest horizon of an isolated observatory, and be affected in front and in rear by weather conditions unobservable from it. Even such bird observatories are as yet few in number. There is one at Riga, one in Algiers, another in Heligoland, and the one so well known, at Buda-Pesth, which cooperates with an observer in almost

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[1] (1) "Die Vogelwarte Rossitten der Deutschen Ornithologischen Gesellschaft und das Kennzeichnen der Vögel." By Dr. J. Thienemann. Pp. 36. (Berlin: Paul Parey. 1910.)

(2) "Aigrettes and Bird Skins: the Truth about their Collection and Export." By Harold Hamel Smith. With a Foreword by Sir J. D. Rees, K.C.I.E., C.V.O., M.P. Pp. iv+138. (London: John Bale, Sons, and Danielsson, Ltd., 1910.) Price 5s.

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